UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MEMORANDUM

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

November 29, 1999

SUBJECT: **Etridiazole (Terrazole®) - Revised Acute and Chronic (Cancer and Non-Cancer) Dietary Exposure Analyses**. Chemical#: 084701. DP Barcode D261366. Case #:819299 Submission #:S570264.

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To: Roberta Farrell, Chemical Review Manager
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Action Requested

Provide an estimate of the acute and chronic (non-cancer and cancer) dietary exposure and associated risk for etridiazole resulting from consumption of commodities supported through reregistration.

Executive Summary

Acute and chronic dietary exposure analyses for etridiazole were performed using the Dietary Exposure Evaluation Model (DEEM™). For the acute and chronic (cancer and non-cancer) analyses, tolerance residue levels and 100% percent crop treated (CT) were assumed. The results of the acute analysis indicate that the acute dietary risks associated with the proposed uses of etridiazole do not exceed HED's level of concern for females 13-50 years. The chronic (non-cancer) risk estimates do not exceed HED's level of concern for the U.S. population and all subgroups. The chronic (cancer) risk estimate initially exceeded HED's level of concern for the U.S. population. The chronic cancer dietary exposure analysis was refined by using residue levels of ½ limit of quantitation (LOQ) and weighted average %CT estimates (BEAD 6/99, Attachment 1). The resulting risk estimate did not exceed HED's level of concern for the U.S. population.

Toxicological Endpoints

On April 27, 1999 the Health Effects Division (HED) Hazard Identification Assessment Review Committee (HIARC) evaluated the toxicology data base of etridiazole and re-assessed the existing Reference Dose (RfD) and established toxicological endpoints for acute and chronic dietary and occupational exposure risk assessments. The HIARC also addressed the potential enhanced sensitivity of infants and children from exposure to etridiazole as required by the Food Quality Protection Act (FQPA) of 1996 (HED DOC. NO. 013543, 6/29/99). A summary of the toxicological endpoints chosen by the HIARC is listed in Table 1.

FQPA Recommendation

The HED FQPA Safety Factor Committee (SFC) met on June 3, 1999 to evaluate the hazard and exposure data for etridiazole and recommended that the FQPA safety factor (as required by FQPA of August 3, 1996) be **reduced** to **3x** in assessing the risk posed by etridiazole.

The FQPA safety factor for etridiazole is applicable to **all population subgroups** since there is uncertainty due to the data gap for the 2-generation reproduction study in rats which could identify potential reproductive effects to the parental animals or to the offspring following exposure to etridiazole.

The FQPA safety factor for etridiazole is **applicable to chronic dietary risk assessment** since there is uncertainty for due to the data gap for the 2-generation reproduction study in rats which could identify potential reproductive effects to the parental animals or to the offspring following exposure to etridiazole. The safety factor is **not applicable to acute dietary risk assessment** since no increased susceptibility was demonstrated following *in utero* exposure and the 2-generation reproductive study may not provide information on the potential for effects

occurring after a single dose (exposure).

The acute and chronic Population Adjusted Doses (aPAD and cPAD) are modifications of the acute and chronic RfDs to accommodate the FQPA Safety Factor. The PAD is equal to the acute or chronic RfD divided by the FQPA Safety Factor. **Since the HED FQPA SFC determined to reduce the safety factor to 3x, the RfD has been adjusted to reflect the PAD.** Therefore, the cPAD for the U.S. general population and all population subgroups is 0.005 (0.016 mg/kg/day ÷ 3 = 0.005 mg/kg/day) for chronic dietary exposure. The aPAD for females 13-50 is 0.15 mg/kg/day (safety factor not applicable).

TABLE 1. SUMMARY OF TOXICOLOGY ENDPOINT SELECTION

EXPOSURE SCENARIO	DOSE (mg/kg/day)	ENDPOINT	STUDY
Acute Dietary (Females 13+)	NOAEL=15 UF=100	Reduced fetal body weights, decreased viability and external and skeletal malformations/variations.	Developmental- Rabbit
	Acute RfD = 0.15 mg/kg Acute PAD =0.15 mg/kg		
Acute Dietary (General Population including adult males, Infants and Children)	An appropriate endpoint attributable to a single exposure (dose) was not identified in oral toxicity studies (including the developmental toxicity studies in rats and rabbits) that is applicable to subpopulations other than females of childbearing age (13+ years old).		
	Risk Assessment Not Required		
Chronic Dietary	NOAEL=4.8 UF= 300	Increased absolute and relative liver weights, renal tubule cell karyomegaly, hepatocytomegaly and spongiosis.	Carcinogenicity-Rat
	Chronic RfD = 0.016 mg/kg/day Chronic PAD = 0.005 mg/kg/day		
Chronic (Cancer) Dietary	**Group B_2 chemical**- "probable human carcinogen"- **Q_1* = 3.33 x 10^{-2} (mg/kg/day)$^{-1}$** in human equivalents.		

$$PAD = \frac{\text{RfD (acute or chronic)}}{\text{FQPA Safety Factor}}$$

Cancer

Etridiazole was classified as a Group B2, Probable Human Carcinogen. It was determined that the most potent unit risk, Q_1*, is that for male rat combined (adenomas and/or carcinomas) thyroid follicular cell tumor rates at 3.33 x 10^{-2} in human equivalents [converted from animals to humans by use of the (mg/kg body weight)$^{3/4}$ Interspecies Scaling Factor](memo K. Dearfield, 1/9/91).

Residue Information

Tolerances are established for residues of etridiazole and its monoacid metabolite, 3-carboxy 5-ethoxy-1,2,4-thiadiazole, on a variety of raw agricultural commodities, milk, meat, poultry and eggs (40 CFR §180.370).

There were no monitoring data available for the commodities being supported through reregistration of etridiazole. Field trial data were available only for cottonseed at a 6x application rate (in-furrow at-planting treatment). Residues of etridiazole were non-detectable (<LOQ) in the cottonseed field trial. Magnitude of the residue data requirements were waived for seed treatment uses on barley, beans, cotton, corn, peanuts, peas, sorghum, safflower, soybean and wheat (D188371, P.Deschamp, 3/4/93). Metabolism studies on soybeans and wheat conducted at exaggerated rates were performed to support seed treatment uses of etridiazole. Tolerance residue levels (tolerance is equal to etridiazole and metabolite combined LOQ) were used for commodities in the Tier 1dietary exposure analyses. Since the residues of etridiazole and its monoacid metabolite were non-detectable in the cottonseed field trial and soybean and wheat metabolism studies (<LOQ), the cancer dietary exposure analysis was refined using ½ LOQ residue levels. For imported tomatoes, the current tolerance of 0.15 ppm for domestically grown tomatoes was used in all the dietary analyses. The risk assessment may be modified upon establishment of a tolerance to support use on imported tomatoes. Available metabolism data indicate that a Category 6(a)3 {40CFR 180.6(a)3 “no reasonable expectation of finite residues”} situation exists with respect to residues of etridiazole in meat, meat by-products, fat, milk and eggs. Therefore, animal commodities are not included in the dietary risk assessment. The established and reassessed tolerances for the residues of etridiazole and its monoacid metabolite are presented in Table 2.

Table 2. Tolerance Reassessment Summary for Etridiazole

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR §180.370:			
Avocados	0.15	Revoke	The registrant is no longer supporting use on avocados.
Corn, field, grain	0.05	0.1	Residue data indicate that the tolerance for residues in/on corn grain should be increased to 0.1 ppm.
Corn, fodder	0.1	0.1	
Corn, forage	0.1	0.1	
Cotton, seed	0.2	0.1	The available data support lowering the tolerance. *Cotton, undelinted seed*
Strawberries	0.2	Revoke	The registrant is no longer supporting use on strawberries.
Tomatoes	0.15	**To Be Determined**	The registrant is no longer supporting use on domestically grown tomatoes. Tolerance to be determined based on import residue field trial data.
Wheat, grain	0.05	0.1	Residue data indicate that the tolerance for residues in/on wheat grain should be increased to 0.1 ppm.
Wheat, forage	0.1	0.1	
Wheat, straw	0.1	0.1	
Eggs	0.05	Revoke	A Category 6(a)3 situation exists with respect to residues of etridiazole and the monoacid metabolite in livestock commodities.
Milk	0.05		
Fat, mbyp, and meat of poultry	0.10		
Fat of cattle, goats, hogs, horses, and sheep	0.10		
Meat and mbyp of cattle, goats, hogs, horses, & sheep	0.10		

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances needed under 40 CFR §180.370 (a)			
Cotton gin byproducts	None	0.1	The available data support establishing a tolerance of 0.1 ppm for residues in *cotton gin byproducts.*
Foliage of legume vegetables crop group	None	0.1	Residue data support establishing a 0.1 ppm tolerance on the *foliage of legume vegetables* crop group.
Legume vegetables (succulent or dried) crop group	None	0.1	The available data support establishing a tolerance of 0.1 ppm for residues in the *legume vegetables (succulent or dried)* crop group.
Barley, grain	None	0.1	Residue data support a 0.1 ppm tolerance.
Barley, hay	None	0.1	
Peanut, nutmeat	None	0.1	
Peanut, hay	None	0.1	
Safflower seed	None	0.1	
Sorghum, grain	None	0.1	
Sorghum, forage	None	0.1	

N.B.tolerance based on combined LOQ of etridiazole and its monoacid metabolite.

Acute Dietary Exposure Analysis

For the acute analysis, tolerance level residues and 100% percent crop treated was assumed for all commodities. Etridiazole use on domestically grown tomatoes is no longer being supported by the registrant and etridiazole may be used on imported tomatoes. A conservative 100% CT was used for all tomato commodities (assumes all tomatoes consumed are treated with etridiazole). The established tolerance for domestic tomatoes (0.15 ppm) was used for the residue level for tomato commodities.

Chronic (Cancer and Non-Cancer) Dietary Exposure Analysis

For the chronic (cancer and non-cancer) analyses, tolerance level residues and 100% CT were assumed for all commodities. The chronic (cancer) analysis was further refined and included residue levels of ½ the combined LOQs for etridiazole and monoacid metabolite (0.05 ppm) for all commodities except tomatoes. The established tolerance for domestic tomatoes (0.15 ppm) was used for the residue level for tomato commodities. Weighted average %CT estimates (BEAD 6/99) were used in the refined chronic (cancer) analysis. Imported tomato commodities were estimated by BEAD to have less than 1% CT.

DEEM™ default concentration factors were used for all commodities. Summaries of the residue information used in the acute and chronic analyses are attached (Attachments 2-5).

Results/Discussion

The DEEM™ acute dietary risk analysis estimates the distribution of single day exposures for the overall U.S. population and certain subgroups. The DEEM™ analysis evaluates the individual food consumption as reported by respondents in the USDA 1989-92 Nationwide Continuing Surveys of Food Intake by Individuals (CSFII) and accumulated exposure to the chemical for each commodity.

Acute Dietary Exposure Analysis

Dietary exposures and associated acute risk for the females 13-50 years old, the population of concern, are shown in Table 3.

Table 3. Summary of Results of Acute DEEM Analysis for Etridiazole

Subgroups	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure (mg/kg)	% aPAD	Exposure (mg/kg)	% aPAD	Exposure (mg/kg)	% aPAD
Females (13+yrs/preg/not nursing)	0.001371	< 1.0	0.002390	1.6	0.003330	2.2
Females (13+yrs/nursing)	0.001754	1.2	0.002468	1.6	0.003019	2.0
Females (13-19yrs/not pregnant/not nursing)	0.002008	1.3	0.003375	2.2	0.006850	4.6
Females (20+yrs/not pregnant/not nursing)	0.001313	< 1.0	0.002457	1.6	0.004169	2.8
Females (13-50 years)	0.001541	1.0	0.002795	1.9	0.005323	3.6

The results of the acute analysis indicate that at the 95th , 99th, and 99.9th percentile the acute dietary risks associated with the proposed uses of etridiazole are below HED's level of concern (percent aPAD does not exceed 100%).

Chronic Non-Cancer Dietary Exposure Analysis

Chronic non-cancer dietary exposures for the U.S. population and other subgroups are presented in Table 4. A full listing of chronic dietary exposures is attached (Attachment 6).

Table 4. Summary of Results from Chronic Non-Cancer DEEM Analysis for Etridiazole.

Subgroups	Exposure (mg/kg/day)	% cPAD
U.S. Population	0.000688	14
Non-nursing Infants	0.001024	20
Children 1-6 yrs	0.001534	31
Females 13-19yrs (not pregnant/not nursing)	0.000676	14
Males 13-19 yrs	0.000767	15

The results of the chronic analysis indicate that the chronic (non-cancer) dietary risk associated with the proposed uses of etridiazole is below HED's level of concern (percent cPAD does not exceed

100%).

Chronic Cancer Dietary Exposure Analysis

When tolerance level residues and 100% CT are used in the analysis, the carcinogenic risk estimate for etridiazole is **1.6×10^{-5}** for the general US population. When the analysis is refined using residue levels of ½ the combined LOQs for etridiazole and monoacid metabolite (0.05 ppm) for all commodities except tomatoes (domestic tomato tolerance was used for tomato commodities) as well as weighted average %CT estimates (BEAD 6/99), the carcinogenic risk estimate for etridiazole is **1.6×10^{-7}** for the general U.S. population. The dietary exposure for the U.S. population was 0.000005 mg/kg/day.

Conclusions

The acute analysis was performed only for females 13-50 years old using tolerance level residues for all commodities and assuming 100% CT. At the 95th percentile the percent of aPAD did not exceed 100 (highest exposed subgroup, females 13-19 years old, not pregnant/not nursing, 1.3% of the aPAD). The results of the acute analysis indicate that the acute dietary risk associated with the existing and proposed uses of etridiazole does not exceed HED's level of concern.

The chronic non-cancer analysis was performed using tolerance level residues for all commodities and assuming 100% CT. The chronic non-cancer risk estimates do not exceed HED's level of concern for the U.S. population and all subgroups (%cPADs did not exceed 100 with highest exposed subgroup, children 1-6 years old, at 31% of the cPAD). These results indicate that the chronic non-cancer dietary risk associated with the existing and proposed uses of etridiazole do not exceed HED's level of concern.

The refined cancer analysis was performed using residue levels of ½ the combined LOQs for etridiazole and monoacid metabolite (0.05 ppm) for all commodities except tomatoes (domestic tomato tolerance was used for tomato commodities) as well as weighted average %CT estimates (BEAD 6/99). The dietary exposure for the U.S. population was 0.000005 mg/kg/day. The carcinogenic risk estimate for etridiazole is **1.6×10^{-7}** for the general US population.

Attachments

Attachment 1: Quantitative Usage Analysis, BEAD 6/99
Attachment 2: Residue File for Acute and Chronic DEEM™ Analyses
Attachment 3: Acute DEEM™ Analysis (Females 13-50)
Attachment 4: Chronic (non-cancer) DEEM™ Analysis
Attachment 5: Residue File for Refined Cancer DEEM™ Analysis
Attachment 6: Refined Cancer DEEM™ Analysis

cc (w/attachments): D.Drew, List A File, L. Richardson (CEB1), Roberta Farrell (SRRD)
RDI: DE Sac [S.Levy 11/29/99, C. Christensen 11/29/99]; S.Knizner (11/29/99)

Attachment 1: Quantitative Usage Analysis, BEAD 6/99

Quantitative Usage Afsnalysis for Etridiazole

Case Number: 0009 PC Code: 84701
Date: June 15, 1999 Analyst: Steven M. Nako

Etridiazole Use: Food Crops

Total average annual use of etridiazole is estimated at approximately 75,000 pounds of active ingredient (lbs ai). Cotton is the primarily agricultural use site. About 42,500 lbs ai of etridiazole is applied to cotton; with typical application rates at about 0.17 lbs ai/acre. Etridiazole is also registered for use as a seed treatment on citrus trees, beans/peas, peanuts corn, safflower, sorghum, soybeans and wheat; of these crops, peanuts appears to have received a modest amount of treatments with etridiazole.

Etridiazole Use: Non-Food Crops/Sites

Etridiazole is also applied to various ornamental plants and shrubs by horticultural nurseries. About 28,000 lbs ai of etridiazole are believed to be applied by nurseries; mainly to control for root diseases (USDA, NAPIAP Report, 1-CA-96). About 5,000 lbs ai of etridiazole are also applied to golf courses.

Etridiazole Use on Imports: Fresh & Processed Tomatoes, Coffee

Etridiazole is also registered for use on tomatoes and coffee abroad. About 32% of the **fresh** tomatoes consumed in the US is imported. /1 Most of the fresh tomato imports come from Mexico (28.5% of the 32%), where etridiazole is not applied. After reviewing these data, I calculated that less than 1% of all fresh tomatoes consumed in the US were treated with etridiazole. For processed tomato products (canned, paste, sauces, juice, etc.), Italy is the primary source country; and about 1% of the acres planted to tomatoes in Italy are treated with etridiazole. But since most (98%) of the processed tomato products consumed in the US are produced domestically; I calculated that less than 1% of all processed tomato products consumed in the US were treated with etridiazole. Similar calculations were made for coffee.

/1 For illustration, the following are calculations on the percent of fresh tomatoes consumed in the US that was treated with etridiazole (1997): 32% = US Imports/Total US Consumption = 1,635/(1,635+3,780-341); Total US Imports = 1,635 Million Lbs, Total US production = 3,780 Mil. Lbs, and Total US Exports = 341 Mil. Lbs. This total amounts to about 16 lbs of fresh tomatoes (disappearance) per person.

Etridiazole	**Case #:**	**0009**	**AI #:**	**84701**			**Analyst:**	**Steven M. Nako**			**June 15, 1999**
Site \1	**Acres Grown (000)**	**Acres Treated (000)**		**% of Crop Treated**		**LB AI Applied (000)**		**Average Application Rate**			**States of Most Usage**
		Wtd Avg	Est Max	Wtd Avg	Est Max	Wtd Avg	Est Max	lb ai/ acre/yr	#appl / yr	lb ai/ A/appl	(% of total lb ai used on this site)
Cotton	12,000	250	500	2.1%	4.2%	43	85.0	0.17	1.00	0.17	MS AR LA TN NC 82%
Seed Treatments (Historical Use): \2											
Grapefruit	194	0	<1	0.0%	<1%	0	<1	0.20	1.00	0.20	FL 100%
Lemons	63	0	<1	0.0%	<1%	0	<1	0.50	1.00	0.50	FL 100%
Oranges	867	0	<1	0.0%	<1%	0	<1	0.50	1.00	0.50	FL 100%
Citrus, Other	51	0	<1	0.2%	<1%	0	<1	0.50	1.00	0.50	FL 100%
Beans/Peas	2,181	0	<1	0.0%	<1%	0	<1	0.16	1.00	0.16	MI 100%
Corn	72,284	8	34	0.0%	<1%	1	6	0.17	1.00	0.17	MI SC 84%
Peanuts	1,610	5	32	0.3%	2.0%	5	17	1.03	1.13	0.92	AL GA NC TX 86%
Safflower (Other Crops)	2,515	1	5	0.0%	<1%	0	1	0.20	1.00	0.20	MT NE 100%
Sorghum	11,280	0	<1	0.0%	<1%	0	<1	0.15	1.00	0.15	
Soybeans	62,879	10	20	0.0%	<1%	2	4	0.20	1.00	0.20	AR MS TN 88%
Wheat, Winter	45,854	0	<1	0.0%	<1%	0	<1	0.15	1.00	0.15	
Non-Agricultural Uses: \3											
Golf Courses	1,400	41	60	2.9%	4.3%	5	8	0.13	1.00	0.13	
Nursery & Greenhouse Ornamentals:											
Container Ornamentals	160	1	2	0.9%	1.2%	22	28	14.57	10.00	1.46	

Etridiazole	Case #:	0009	AI #:	84701		Analyst:		Steven M. Nako			June 15, 1999
Site \1	Acres Grown (000)	Acres Treated (000)		% of Crop Treated		LB AI Applied (000)		Average Application Rate			States of Most Usage
		Wtd Avg	Est Max	Wtd Avg	Est Max	Wtd Avg	Est Max	lb ai/ acre/yr	#appl / yr	lb ai/ A/appl	(% of total lb ai used on this site)
Greenhouse	11	2	2	14.3%	18.4%	6	8	3.79	6.05	0.63	
Total		294	429			75	102				
Import Tolerances: \4				-- % US Consumption --							Countries w/most Use
Tomatoes, Fresh				0.0%	<1%						Italy
Tomatoes, Processed				0.1%	<1%						Italy
Coffee				0.0%	<1%						Costa Rica

- - **PLEASE SEE NOTES TO TABLE: NEXT PAGE** - -

COLUMN HEADINGS

Wtd Avg = Weighted average--the most recent years and more reliable data are weighted more heavily.
Est Max = Estimated maximum, which is estimated from available data.
Average application rates are calculated from the weighted averages.

CROP GROUPS

Citrus, Other includes kumquats, limes, tangelos, and tangerines.
Other Crops include ornamentals, popcorn, rapeseed/canola, and safflower.

NOTES ON TABLE DATA

Usage data primarily covers 1987 - 1996.
Calculations of the above numbers may not appear to agree because they are displayed as rounded to the nearest 1000 for acres treated or lb. a.i.
(Therefore 0 = < 500), or to the nearest whole percentage point for % of crop treated. (Therefore 0% = < 0.5%)
0* = Available EPA sources indicate that no usage is observed in the reported data for this site, which implies that there is little or no usage.
(-) = Iindicates that information on this site is NOT available in EPA sources or is insufficient.

\1 SOURCES: Various EPA data sources, USDA\NASS Agricultural Chemical Usage, and National Center for Food and Agricultural Policy, Doane Marketing Research Inc..
\2 The pesticide use estimates for other crops (besides cotton) are generally seed treatments. According to the primary registrant, these products are no longer actively marketed.
\3 The calculated %CT estimates are calculated based on estimates of total pounds applied by this industry. Source: USDA NAPIAP (1-CA-96): Garber, M.P., et. al.: 'Biological and Economic Assessment of Pest Management in the United States Greenhouse and Nursery Industry, U. of Georgia, Cooperative Extension Service, Kline, SRI Greenhouse & Nursery Report.
\4 The %CT estimates for imported tomatoes and coffee are based on a weighted average of %CT from the source countries; where weight=share of imports. For example, since etridiazole is not applied to Mexican tomatoes, the overall contribution from Mexican imports is 0 (=28% Share of US Consumption x 0 %CT). Sources: USDA, ERS Foreign Agricultural Trade in the US (FATUS, 1997), USDA, NASS Agricultural Statistics, 1998; Produce Studies.

Attachment 2: Residue File for Acute and Chronic DEEM™ Analyses

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U.S. Environmental Protection Agency                                    Ver. 6.76
DEEM Chronic analysis for ETRIDIAZOLE                                 1989-92 data
Residue file: C:\DEEM\084701\Terra3.r96                             Adjust. #2 used
Analysis Date 11-24-1999           Residue file dated: 11-23-1999/15:24:01/8
Reference dose (RfD) = 0.005 mg/kg bw/day
Comment:Tier1 100% CT and Tolerance-no m/m
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Food Code	Crop Grp	Food Name	RESIDUE (ppm)	Adj.Factors #1	#2
159	8	Tomatoes-whole	0.150000	1.000	1.000
160	8	Tomatoes-juice	0.150000	1.500	1.000
161	8	Tomatoes-puree	0.150000	3.300	1.000
162	8	Tomatoes-paste	0.150000	5.400	1.000
163	8	Tomatoes-catsup	0.150000	2.500	1.000
227	6C	Beans-dry-great northern	0.100000	1.000	1.000
228	6C	Beans-dry-kidney	0.100000	1.000	1.000
229	6C	Beans-dry-lima	0.100000	1.000	1.000
230	6C	Beans-dry-navy (pea)	0.100000	1.000	1.000
231	6C	Beans-dry-other	0.100000	1.000	1.000
232	6C	Beans-dry-pinto	0.100000	1.000	1.000
233	6B	Beans-succulent-lima	0.100000	1.000	1.000
234	6A	Beans-succulent-green	0.100000	1.000	1.000
235	6A	Beans-succulent-other	0.100000	1.000	1.000
236	6A	Beans-succulent-yellow/wax	0.100000	1.000	1.000
237	15	Corn/pop	0.100000	1.000	1.000
238	15	Corn/sweet	0.100000	1.000	1.000
240	6C	Peas (garden)-dry	0.100000	1.000	1.000
241	6AB	Peas (garden)-green	0.100000	1.000	1.000
243	6C	Lentils	0.100000	1.000	1.000
244	6C	Mung beans (sprouts)	0.100000	1.000	1.000
249	6C	Beans-dry-broadbeans	0.100000	1.000	1.000
250	6B	Beans-succulent-broadbeans	0.100000	1.000	1.000
251	6C	Beans-dry-pigeon beans	0.100000	1.000	1.000
253	6	Beans-unspecified	0.100000	1.000	1.000
255	6A	Soybeans-sprouted seeds	0.100000	0.330	1.000
256		Beans-dry-hyacinth	0.100000	1.000	1.000
257		Beans-succulent-hyacinth	0.100000	1.000	1.000
258	6C	Beans-dry-blackeye peas/cowpea	0.100000	1.000	1.000
259	6C	Beans-dry-garbanzo/chick pea	0.100000	1.000	1.000
265	15	Barley	0.100000	1.000	1.000
266	15	Corn grain-endosperm	0.100000	1.000	1.000
267	15	Corn grain-bran	0.100000	1.000	1.000
268	15	Corn grain/sugar/hfcs	0.100000	1.500	1.000
275	15	Sorghum (including milo)	0.100000	1.000	1.000
276	15	Wheat-rough	0.100000	1.000	1.000
277	15	Wheat-germ	0.100000	1.000	1.000
278	15	Wheat-bran	0.100000	1.000	1.000
279	15	Wheat-flour	0.100000	1.000	1.000
280	15	Millet	0.100000	1.000	1.000
287	6C	Guar beans	0.100000	1.000	1.000
289	15	Corn grain-oil	0.100000	1.000	1.000
290	O	Cottonseed-oil	0.100000	1.000	1.000

291	O	Cottonseed-meal	0.100000	1.000	1.000
293	O	Peanuts-oil	0.100000	1.000	1.000
294	O	Safflower-seed	0.100000	1.000	1.000
295	O	Safflower-oil	0.100000	1.000	1.000
297	6A	Soybeans-oil	0.100000	1.000	1.000
303	6A	Soybean-other	0.100000	1.000	1.000
304	6A	Soybeans-mature seeds dry	0.100000	1.000	1.000
305	6A	Soybeans-flour (full fat)	0.100000	1.000	1.000
306	6A	Soybeans-flour (low fat)	0.100000	1.000	1.000
307	6A	Soybeans-flour (defatted)	0.100000	1.000	1.000
403	O	Peanuts-butter	0.100000	1.890	1.000
405	6B	Peas-succulent/blackeye/cowpea	0.100000	1.000	1.000
413	6A	Snowpeas	0.100000	1.000	1.000
423	8	Tomatoes-dried	0.150000	14.300	1.000
437	15	Wheat-germ oil	0.100000	1.000	1.000
482	O	Soybeans-protein isolate	0.100000	1.000	1.000
940	O	Peanuts-hulled	0.100000	1.000	1.000

Attachment 3: Acute DEEM™ Analysis (Females 13-50)

U.S. Environmental Protection Agency Ver. 6.78
DEEM ACUTE analysis for ETRIDIAZOLE (1989-92 data)
Residue file: Terra3.r96 Adjustment factor #2 used.
Analysis Date: 11-23-1999/15:19:20 Residue file dated: 11-23-1999/15:16:45/8
Acute Reference Dose (aRfD) = 0.150000 mg/kg body-wt/day
NOEL (Acute) = 15.000000 mg/kg body-wt/day
Run Comment: Tier1 100% CT and Tolerance-no m/m
==========

Summary calculations:

	95th Percentile			99th Percentile			99.9th Percentile		
	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE	Exposure	% aRfD	MOE
Females (13+/preg/not nsg):	0.001371	0.91	10937	0.002390	1.59	6275	0.003330	2.22	4504
Females (13+/nursing):	0.001754	1.17	8551	0.002468	1.65	6077	0.003019	2.01	4969
Females (13-19 yrs/np/nn):	0.002008	1.34	7470	0.003375	2.25	4444	0.006850	4.57	2189
Females (20+ years/np/nn):	0.001313	0.88	11426	0.002457	1.64	6104	0.004169	2.78	3597
Females (13-50 years):	0.001541	1.03	9731	0.002795	1.86	5366	0.005323	3.55	2818

Attachment 4: Chronic (non-cancer) DEEM™ Analysis

U.S. Environmental Protection Agency Ver. 6.76
DEEM Chronic analysis for ETRIDIAZOLE (1989-92 data)
Residue file name: C:\DEEM\084701\Terra3.r96 Adjustment factor #2 used.
Analysis Date 11-24-1999/07:47:48 Residue file dated: 11-23-1999/15:24:01/8
Reference dose (RfD, CHRONIC) = .005 mg/kg bw/day
COMMENT 1: Tier1 100% CT and Tolerance-no m/m

Total exposure by population subgroup

Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Percent of Rfd
U.S. Population (total)	0.000688	13.8%
U.S. Population (spring season)	0.000660	13.2%
U.S. Population (summer season)	0.000698	14.0%
U.S. Population (autumn season)	0.000726	14.5%
U.S. Population (winter season)	0.000663	13.3%
Northeast region	0.000716	14.3%
Midwest region	0.000694	13.9%
Southern region	0.000688	13.8%
Western region	0.000652	13.0%
Hispanics	0.000698	14.0%
Non-hispanic whites	0.000692	13.8%
Non-hispanic blacks	0.000652	13.0%
Non-hisp/non-white/non-black)	0.000688	13.8%
All infants (< 1 year)	0.000805	16.1%
Nursing infants	0.000285	5.7%
Non-nursing infants	0.001024	20.5%
Children 1-6 yrs	0.001534	30.7%
Children 7-12 yrs	0.001091	21.8%
Females 13-19(not preg or nursing)	0.000676	13.5%
Females 20+ (not preg or nursing)	0.000470	9.4%
Females 13-50 yrs	0.000538	10.8%
Females 13+ (preg/not nursing)	0.000525	10.5%
Females 13+ (nursing)	0.000631	12.6%
Males 13-19 yrs	0.000767	15.3%
Males 20+ yrs	0.000559	11.2%
Seniors 55+	0.000421	8.4%
Pacific Region	0.000628	12.6%

Attachment 5: Residue File for Refined Cancer DEEM™ Analysis

U.S. Environmental Protection Agency Ver. 6.76
DEEM Chronic analysis for ETRIDIAZOLE 1989-92 data
Residue file: C:\DEEM\084701\Terra2.r96 Adjust. #2 used
Analysis Date 11-24-1999 Residue file dated: 11-24-1999/07:51:23/8
Q* = 0.0333
Comment:Refined cancer(Tier 3 %CT(BEAD) and 1/2 LOD)

Food Code	Crop Grp	Food Name	RESIDUE (ppm)	Adj.Factors #1	#2
159	8	Tomatoes-whole	0.150000	1.000	0.010
160	8	Tomatoes-juice	0.150000	1.500	0.010
161	8	Tomatoes-puree	0.150000	3.300	0.010
162	8	Tomatoes-paste	0.150000	5.400	0.010
163	8	Tomatoes-catsup	0.150000	2.500	0.010
227	6C	Beans-dry-great northern	0.050000	1.000	0.010
228	6C	Beans-dry-kidney	0.050000	1.000	0.010
229	6C	Beans-dry-lima	0.050000	1.000	0.010
230	6C	Beans-dry-navy (pea)	0.050000	1.000	0.010
231	6C	Beans-dry-other	0.050000	1.000	0.010
232	6C	Beans-dry-pinto	0.050000	1.000	0.010
233	6B	Beans-succulent-lima	0.050000	1.000	0.010
234	6A	Beans-succulent-green	0.050000	1.000	0.010
235	6A	Beans-succulent-other	0.050000	1.000	0.010
236	6A	Beans-succulent-yellow/wax	0.050000	1.000	0.010
237	15	Corn/pop	0.050000	1.000	0.010
238	15	Corn/sweet	0.050000	1.000	0.010
240	6C	Peas (garden)-dry	0.050000	1.000	0.010
241	6AB	Peas (garden)-green	0.050000	1.000	0.010
243	6C	Lentils	0.050000	1.000	0.010
244	6C	Mung beans (sprouts)	0.050000	1.000	0.010
249	6C	Beans-dry-broadbeans	0.050000	1.000	0.010
250	6B	Beans-succulent-broadbeans	0.050000	1.000	0.010
251	6C	Beans-dry-pigeon beans	0.050000	1.000	0.010
253	6	Beans-unspecified	0.050000	1.000	0.010
255	6A	Soybeans-sprouted seeds	0.050000	0.330	0.010
256		Beans-dry-hyacinth	0.050000	1.000	0.010
257		Beans-succulent-hyacinth	0.050000	1.000	0.010
258	6C	Beans-dry-blackeye peas/cowpea	0.050000	1.000	0.010
259	6C	Beans-dry-garbanzo/chick pea	0.050000	1.000	0.010
265	15	Barley	0.050000	1.000	0.010
266	15	Corn grain-endosperm	0.050000	1.000	0.010
267	15	Corn grain-bran	0.050000	1.000	0.010
268	15	Corn grain/sugar/hfcs	0.050000	1.500	0.010
275	15	Sorghum (including milo)	0.050000	1.000	0.010

276	15	Wheat-rough	0.050000	1.000	0.010
277	15	Wheat-germ	0.050000	1.000	0.010
278	15	Wheat-bran	0.050000	1.000	0.010
279	15	Wheat-flour	0.050000	1.000	0.010
280	15	Millet	0.050000	1.000	0.010
287	6C	Guar beans	0.050000	1.000	0.010
289	15	Corn grain-oil	0.050000	1.000	0.010
290	O	Cottonseed-oil	0.050000	1.000	0.020
291	O	Cottonseed-meal	0.050000	1.000	0.020
293	O	Peanuts-oil	0.050000	1.000	0.010
294	O	Safflower-seed	0.050000	1.000	0.010
295	O	Safflower-oil	0.050000	1.000	0.010
297	6A	Soybeans-oil	0.050000	1.000	0.010
303	6A	Soybean-other	0.050000	1.000	0.010
304	6A	Soybeans-mature seeds dry	0.050000	1.000	0.010
305	6A	Soybeans-flour (full fat)	0.050000	1.000	0.010
306	6A	Soybeans-flour (low fat)	0.050000	1.000	0.010
307	6A	Soybeans-flour (defatted)	0.050000	1.000	0.010
403	O	Peanuts-butter	0.050000	1.890	0.010
405	6B	Peas-succulent/blackeye/cowpea	0.050000	1.000	0.010
413	6A	Snowpeas	0.050000	1.000	0.010
423	8	Tomatoes-dried	0.150000	14.300	0.010
437	15	Wheat-germ oil	0.050000	1.000	0.010
482	O	Soybeans-protein isolate	0.050000	1.000	0.010
940	O	Peanuts-hulled	0.050000	1.000	0.010

Attachment 6: Refined Chronic (cancer) DEEM™ Analysis

U.S. Environmental Protection Agency Ver. 6.76
DEEM Chronic analysis for ETRIDIAZOLE (1989-92 data)
Residue file name: C:\DEEM\084701\Terra2.r96 Adjustment factor #2 used.
Analysis Date 11-24-1999/07:52:19 Residue file dated: 11-24-1999/07:51:23/8
Q* = 0.0333
COMMENT 1: Refined cancer(Tier 3 %CT(BEAD) and 1/2 LOD)

Total exposure by population subgroup

Population Subgroup	Total Exposure mg/kg body wt/day	Total Exposure Lifetime risk (Q*= .0333)
U.S. Population (total)	0.000005	1.62E-07
U.S. Population (spring season)	0.000005	1.55E-07
U.S. Population (summer season)	0.000005	1.65E-07
U.S. Population (autumn season)	0.000005	1.73E-07
U.S. Population (winter season)	0.000005	1.56E-07
Northeast region	0.000005	1.73E-07
Midwest region	0.000005	1.63E-07
Southern region	0.000005	1.61E-07
Western region	0.000005	1.53E-07
Hispanics	0.000005	1.69E-07
Non-hispanic whites	0.000005	1.64E-07
Non-hispanic blacks	0.000004	1.48E-07
Non-hisp/non-white/non-black)	0.000005	1.65E-07
All infants (< 1 year)	0.000005	1.59E-07
Nursing infants	0.000002	6.72E-08

Non-nursing infants	0.000006	1.98E-07
Children 1-6 yrs	0.000011	3.61E-07
Children 7-12 yrs	0.000008	2.57E-07
Females 13-19(not preg or nursing)	0.000005	1.65E-07
Females 20+ (not preg or nursing)	0.000003	1.11E-07
Females 13-50 yrs	0.000004	1.29E-07
Females 13+ (preg/not nursing)	0.000004	1.24E-07
Females 13+ (nursing)	0.000004	1.48E-07
Males 13-19 yrs	0.000005	1.81E-07
Males 20+ yrs	0.000004	1.33E-07
Seniors 55+	0.000003	9.62E-08
Pacific Region	0.000004	1.48E-07
